TABLE NO

MULTIMEDIA UNIVERSITY

STUDENT ID NO

PROGRAMME

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2016/2017

TTP 3121 – TCP/IP PROGRAMMING

(All sections / Groups)

13 October 2016
2.30 pm – 4.30 pm
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 4 printed pages (including cover page) with 5 questions only.

2. Attempt only **ALL Questions.** All Questions carry equal marks (10 marks). The distribution of the marks for each question is given.

3. Please print all your answers in the answer booklet provided.

QUESTION 1 [2+2+2+2+2 marks]

(a) List TWO drawbacks of network congestion in TCP/IP.

(b) Describe function of FreeBSD and OpenBSD.

(c) List the command to

i. know how many lines, words, and characters there are in ABC.dat
ii. remove a folder called, myFolder
Note: Use [] to represent a space

(d) Describe **lseek()** system call.

(e) List the output for the program below.

```
main() {
int childpid;

if ((childpid=fork()) == -1) {
 perror("cannot fork");
exit(1); }
else if (childpid==0){
printf("\nIEEE"); sleep(5);
printf("\nACM"); exit(0); }
else {
sleep(1); printf("\nIET");
exit(0); } }
```

QUESTION 2 [2+2+2+2+2 marks]

(a) Describe operations involved in Line 10 and Line 15 as in Figure below.

```
1  #includs <signal.h>
2
3  main() {
4  static struct sigaction act;
5
6  void catchin( int);
7
8  act.sa_handler = catchin;
9
10 sigfillset (&(act.sa_mask));
11
12 printf("Before sigaction. Try to press [CTRL] C !!!!\n");
13
14 sleep(5);
15 sigaction(SIGINT, &act, (void *)0);
16
17 printf("After sigaction. Try to press [CTRL] C !!!\n");
18 printf("Sleep #1\n");
19 sleep(1);
20 printf("Sleep #2\n");
21 sleep(1);
22 printf("System ended ... \n");
23 exit(0);
24 }
25 void catchin (int signo)
26 {
27 printf("\nCATCHINT: signo = %d\n", signo);
28
29 }
30
31
```

Figure 1

Continued.....

(b) Define pipes and FIFO files.

(c) Define the main function of **gethostname()** system call.

(d) Describe **pselect()** system call.

(e) Describe the issue of RPC in
i. Performance
ii. Authentication

QUESTION 3 [2+2+2+4 marks]

(a) Identify TWO advantages for using both server and client on the same machine.

(b) Identify the errors in the code below and rectify them.

```
main()
{
    int p[2], pid;
    char buf[4];
    if(pipe(p) == -1)   {
        perror("pipe call");
        exit(1);
    }
write (p[1], "hi here", 5);
read(p[2], buf, 5);

printf("%s\n", buf);

}
```

(c) Differentiate **in_addr_t inet_addr(const char *strptr)** system call and **char * inet_ntoa (struct in_addr inaddr)** system call.

(d) Identify the argument differences for
i. **send()** and **sendto()**
ii. **recv()** and **recvfrom()**

QUESTION 4 [3+3+2+2 marks]

(a) Compose a program to write an input from user and append the input to a file called "input.dat". Your program should create the "input.dat" file if it does not exist.

Continued.....

(b) Compose a short program that uses ***execl()*** and ***execv()*** system calls to execute command *rm –r Dir* . The prototypes of ***execl()*** and ***execv()*** are given as follow:
int execl (char *pathname, char *arg0, char *arg1, ...,char *argn, (char *) 0);
int execv(char *pathname, char **argv);

(c) Modify the statement (Figure 1) in Question 2 in order for system to
i) take default
ii) ignore the signal

(d) Propose TWO approaches to generate IPC facilities key.

QUESTION 5 [5+3+2marks]

(a) Compose a TCP server program that receives message from a TCP client program. With the message (Arabic numerals), convert it to text. For example, message 1234 will be converted to one two three four. Your TCP server program should send the outcome of conversion to remote TCP client program. Header file (inet.h) is provided as in Figure 2. [Note: Use only system calls to complete this task]

```
/*inet.h*/
#include<stdio.h>
#include <stdlib.h>
#include<sys/types.h>
#include<sys/socket.h>
#include<netinet/in.h>
#include<arpa/inet.h>
#define SERV_TCP_PORT 25000
#define SERV_UDP_PORT 35001
#define CLI_UDP_PORT 35002
```

Figure 2

(b) Compose short code to demonstrate the lock operation in semaphore.

(c) Explain the outcome following codes
i) if (FD_ISSET (STDIN, &readfds));
ii) FD_SET(STDIN, &readfds);

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